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ABSTRACT

The effects of learning potential and teacher expectancies on IQ, school achievement, and teacher ratings were studied in eight segregated special classes for the retarded. The 58 EMR subjects were divided into four groups in a two design. A strong learning potential effect and a weak teacher expectancy effect were found for the IQ variables. A consistent interaction effect was found for changes in both teacher ratings and school achievement in spelling showing unexpected inferiority of the High Learning Potential-High Expectancy group. The results indicated further support of the validity of learning potential measurement and demonstrate how mental retardation can become a self fulfilling prophecy. (Author)

STUDIES IN LEARNING POTENTIAL

EFFECTS OF LEARNING POTENTIAL AND TEACHER EXPECTANCIES IN CLASSES FOR THE RETARDED; OR: THE PUNISHING EXPECTANCIES

by

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EFFECTS OF LEARNING POTENTIAL AND TEACHER EXPECTANCIES IN CLASSES FOR THE RETARDED; OR: THE PUNISHING EXPECTANCIES[1]

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Abstract

The effects of learning potential and teacher expectancies on IQ, school achievement and teacher ratings were studied in eight segregated special classes for the retarded. The 58 EMR subjects were divided into four groups in a 2 x 2 design. A strong learning potential effect and a weak teacher expectancy effect were found for the IQ variables. A consistent interaction effect was found for changes in both teacher ratings and school achievement in spelling showing unexpected inferiority of the "High Learning Potential - High Expectancy" group. The results indicated further support of the validity of learning potential measurement and demonstrate how mental retardation can become a "self fulfilling prophecy."

EFFECTS OF LEARNING POTENTIAL AND TEACHER EXPECTANCIES IN CLASSES FOR THE RETARDED; OR: THE PUNISHING EXPECTANCIES

Elisha Y. Babad

Annoyed with the cultural bias of traditional IQ tests and the misclassification of many underprivileged children as "mentally retarded," Budoff and his associates (Budoff, 1967, 1968, 1969, 1970, Babad, 1971) developed in recent years a process-oriented conceptualization of intelligence, based on "Learning Potential." IQ tests are based on the assumption that children spontaneously acquire skills and knowledge from their natural environment that will relate to subsequent school success, and that differences in test scores measuring competence on these skills reflect underlying differences in (inborn) ability. Disadvantaged children do not have experiences which facilitate spontaneous acquisition of school-relevant skills, and tend to perform poorly on IQ tests. Their low IQs may reflect, to a large extent, cultural differences rather than inferior mental capacities. The Learning Potential paradigm minimizes the effects of these cultural differences by providing all subjects with appropriate experiences relevant to dealing with the test problems. Differences in ability among subjects are then reflected in their level of competence following appropriate training.

The major task in the Series Learning Potential Test* is completion of picture series - a non-verbal reasoning task falling in the "superordinate concept" category. The "one shot" test is replaced with a three-stage program - "pre-test - coach - test." The pre-test allows the

*The test has recently been standardized, and a test manual (by Babad and Budoff) is under preparation at the present time.

subjects to familiarize themselves with the demands of the task, experience some difficulties, learn to know the tester, and get more comfortable with the test situation. The coaching session which immediately follows provides the subjects with a continuous success experience. In the 30 minute session they learn how to approach the series problems and what strategies to employ. They learn to form the concepts using their sense of rhythm, to isolate the concepts and solve one at the time, eliminating wrong choices step by step. An equivalent form of the test is administered two or three days after the coaching. Performance on this post-test reflects the combined effect of initial ability and learning gained through coaching.

The Series Learning Potential Test was specifically designed for underprivileged children, providing them, in microcosm, with relevant learning experiences,thus compensating for deficiencies in their background. The final (post coaching) performance gives a better indication of capacity, although most of it may still be unrealized. Babad (1971) found the Series Learning Potential Test to be more sensitive to differences in ability among underprivileged dull normals and educable mentally retarded (EMR) children than among brighter middle-class children. He also found that substantial proportions of so-called "mentally retarded" children could reach, following 30 minutes of coaching, the reasoning level of their non-retarded controls. The post-test distribution was much flatter than the pre-test distribution, and the relative

positions of numerous subjects were markedly changed. These two facts give rise to the hope that the learning potential measurement paradigm will contribute to minimizing misclassification of disadvantaged children as mentally retarded.

The discovery of previously unrecognized learning potential of some EMR children makes one wonder how this potential can affect what takes place in the segregated special class. The first question is how the teachers' knowledge of their students' learning potential would affect the students' achievements. Ample evidence (see Rosenthal and Jacobson, 1968, Rosenthal, 1969, 1970) indicates that positive teacher expectancies can indeed affect student's performance. However, in typical expectancy studies, the teachers' beliefs are formed by faked information provided by the investigators, while there are no actual differences between high expectancy and low expectancy subjects. This author knows of no study in which real potential was used to establish teachers' expectancies. It is, therefore, very attractive to study teacher expectancies in conjunction with learning potential, as one can then isolate the changes due to teacher expectancies, those due to learning potential, and the effects of the interaction of these factors.

The study of both learning potential and teacher expectancies becomes particularly significant in consideration of mental retardation and in the context of special education for the retarded. Although it is well founded that the educable mentally retarded group contains not only retarded children, but also capable disadvantaged children, the entire group is highly stigmatized, and

the special class is known in the school as the invariable collection of "dummies." Expectations for cognitive growth and for considerable school progress (by the teachers, peers, and the EMR child himself) are rather low. At the same time, the number of students in the special class is small, enabling the teacher to give much individual attention to each child. The combination of these factors is very promising - the children's potential ability to learn, the wide room for change in expectancies, and the opportunity for teachers to work individually with each child.

Two teacher expectancy studies with EMR subjects have been recently reported. Both studies established the expectancies on faked test results. Haskett (1968) reported significant correlations between teacher expectancy and student social development, while Gozali and Meyen (1970) found no effects of teacher expectancies on school achievements in reading, vocabulary, spelling, and arithmetic.

The present study was designed mainly to validate the measurement of learning potential. Teacher expectancies were manipulated in order to find out whether the combination of high learning potential and high teacher expectancy would indeed cause the largest improvement. Special class EMR children were divided into four groups in a 2 x 2 factorial design, with learning potential (high and low) and teacher expectancy of potential (high and low) as the independent variables. Measures of intelligence, school achievement, and teachers' perceptions of the children were the dependent variables. The general hypothesis was that for any

measure, the "High Learning Potential - High Expectancy" group would improve the most, and the "Low Learning Potential - Low Expectancy" group would improve the least. The relative standings of the remaining groups (high on one independent variable and low on the other) were expected to reflect the relative impact of each of the two variables.

Method

Subjects and teachers

Subjects were fifty-eight children in eight segregated special classes for the retarded. The classes were located in a small New England city, with a predominantly white working-class population. Two of the initial ten classes were disbanded in the course of the year, and 22 of the original eighty subjects were not available for post-testing. The 58 remaining subjects (34 males and 24 females) ranged in age from six to fifteen years. Each special class consisted of five to ten children within a three-year range. All children were classified EMRs, with WISC IQs averaging 68.2 (± 8.5 points). All came from lower-middle or lower-class homes, and none were diagnosed as brain-damaged.

All eight teachers were females, four in their fifties and four in their late twenties. All of them have been special class teachers for most of their teaching careers.

Materials:

1) Learning Potential: a pilot form of the Series Learning

Potential Test (see Babad, 1971, for details) was used. Administration of the test followed the standard procedure; the coaching session immediately followed the pre-test, and the post-test was given two days to a week later.

2) IQ: Flanagan's TOGA (Test of General Ability, Flanagan, 1960) was used. It yielded three scores: verbal and non-verbal grade equivalents, and a total IQ.

3) School achievement: The WRAT (Wide Range Achievement Test, Jastak and Jastak, 1965) was used. It provides grade equivalents for reading, spelling and arithmetic.

4) Teacher ratings: The teachers rated each of their students on eight 7-point scales: 1) pleasant - not pleasant; 2) polite - impolite; 3) cooperative - uncooperative; 4) high ability - low ability; 5) good looking - not good looking; 6) high academic potential - low academic potential; 7) "good" family background - "bad" family background; 8) "strong" personality - "weak" personality.

Procedure

The study lasted from October to late June, with an expectancy period of about eight months. The pretesting took three sessions, two for the group Learning Potential Test and one for the TOGA. (The WRAT was independently administered by the school psychologist at the beginning and at the end of the school year.) Each of the teachers had an initial individual session with the investigator, who was introduced to them as an expert in the field. In this session, he explained to them the nature of Learning Potential

measurement. It was explicitly pointed out that the test taps potential for learning and not actual achievements. At the end of the session, the teachers filled out the rating scales, and they were then invited to observe the administration of the test.

Following the completion of testing, the subjects were divided into two learning potential groups. The division was made separately for each age group. Between one third and one half of the subjects were included in the "High Learning Potential" group, depending on the nature of the distributions. Of the 58 subjects remaining for the final analysis, 25 fell in the "High Learning Potential" group, and 33 in the "Low Learning Potential" group. Each group was then divided at random into "High Expectancy" and "Low Expectancy" groups. Thus, four experimental groups were created: "Hi LP - Hi EX" (n = 15), "Hi LP - Lo EX" (n = 10), "Lo LP - Hi EX" (n = 14), and "Lo LP - Lo EX" (n = 19). [Due to later shrinkage in the number of subjects, the final frequencies in the cells are unequal].

A week after the completion of the initial testing, the investigator returned with feedback to the teachers. In this interview (again individual sessions) each teacher was given a list of her students' scores. Half of the scores were previously falsified to fit the teacher expectancy groups. The names of all "High Expectancy" subjects were circled in red, and the investigator pointed them out as showing impressive potential for learning. He repeated that this potential is latent, and that it is understood that many of the "high potential" children do not do well in

school. The lists were then left in the possession of the teachers.

Two additional learning potential measures were administered later in the year, each followed by feedback sessions with the teachers. Data were falsified to fit the original lists, and the investigator expressed satisfaction with the "consistant nature" of the results.

The final testing took place in the last weeks of the school year. The TOGA was administered again, and the teachers filled out new rating scales. Independently, the school psychologist administered the WRAT to all subjects.

Results

The gain scores (improvement from pre-test to post-test) of the four groups on the dependent variables were subjected to analyses of covariance. Pre-test scores were routinely covaried, and in age-related measures (IQ and school achievement variables, normed in grade equivalents) age was covaried as well.

IQ variables

The multi-variate analysis of covariance of the (TOGA) IQ variables (examining the effects of the independent variables on all IQ varaibles at once), showed that the effect of learning potential was significant when age and the pre-test levels on all IQ variables were controlled (Multi-variate $F = 3.71$, $df = 3,48$, $p < .02$). Neither the teacher expectancy effect nor the interaction

effect reached statistical significance. Controlling for age and initial differences among the groups, the "High Learning Potential" subjects improved on the TOGA significantly more than the "Low Learning Potential" ones. Table 1 presents the results

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Insert Table 1
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of the uni-variate analyses of gain scores for performance IQ, verbal IQ, and total IQ. For each of the three variables, it shows levels of significance for the effects of learning potential, teacher expectancy, and their interaction. Several analyses are presented for each variable, controlling for age alone, age and the pre-test scores on that variable, age and pre-test scores on all IQ variables, and pre-test scores on school achievement variables.

From Table 1, one can infer that the significant multi-variate effect of learning potential was caused mainly by the strong effect of that variable on performance IQ. All analyses of performance IQ scores yielded highly significant learning potential effects. The teacher expectancy effect reached statistical significance ($p < .06$) when age and pre-test school achievement scores (each and/or all combined) were controlled. Table 2 presents the mean (grade equivalents) change in performance IQ for the four groups. While

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Insert Table 2
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the "Hi LP - Hi EX" group gained almost one whole grade equivalent in eight months, the "Lo LP - Lo EX" group lost more than one half grade in this period. The significant effects of both learning

potential and teacher expectancy were probably due mainly to the difference between these two groups. The learning potential effect was stronger than the teacher expectancy effect because of the slight improvement of the "Hi LP - Lo EX" group, compared to the absence of any change in the "Lo LP - Hi EX" group. Thus, it seems that performance IQ is most strongly influenced by compatible standings on both independent variables.

Turning now to verbal IQ, we find only a weak main effect ($p<.11$) of teacher expectancy when age and pre-test scores on school achievement variables are controlled. No other effects reached statistical significance. Table 3 presents the mean change

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Insert Table 3
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in verbal IQ for the four groups. It is interesting to note that the largest gain was observed for the "Lo LP - Hi EX" group, and also that the effect of teacher expectancies on (the school-related) verbal IQ reached significance only when pre-test differences in school achievement were taken into account.

The significant findings for the analyses of total IQ reflect the effects we have discuseed thus far for verbal IQ and performance IQ. Both learning potential and teacher expectancy effects attained significance when age was covaried, the learning potential effect was significant when IQ varaibles were covaried, and the teacher expectancy effect was significant when school achievement variables were covaried.

Teacher ratings

The effects of learning potential and teacher expectancies on teacher ratings were quite different than their effects on IQ variables. Consistent interaction effects were evident for seven of the eight ratings, reaching statistical significance for six of the ratings. Table 4 presents the results of the different analyses, with and without covariates (age was not covaried in these analyses). The most dramatic, statistically significant,

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and impressive (or rather depressive) effect was found for the "academic potential" rating. Table 5 shows the mean change for the

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Insert Table 5
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four groups. As can be seen, the "Hi LP - Hi EX" and "Lo LP - Lo EX" groups were seen by the teachers at the completion of the study as having less academic potential than they had eight months earlier, while the "Lo LP - Hi EX" and "Hi LP - Lo EX" groups were seen as having more academic potential. The largest decrease in academic potential was recorded for the "Hi LP - Hi EX" group. As Table 4 indicates, the interaction effect was statistically significant without covariates as well as with all initial ratings covaried.

The same pattern was found for all other dimensions (except "polite"), reaching statistical significance is most cases. Thus, the teachers' perceptions of the "Hi LP - Hi EX" group changed through the course of the study, and these subjects were finally seen as having less academic potential, less ability, and weaker personalities; as coming from a worse family background, as being

less pleasant, and less good looking. The same was true for the "Lo LP - Lo EX" group, while the remaining two groups were perceived more positively on these dimensions than they had been at the initiation of the study.

School achievement

No significant effects were found for reading and arithmetic, but the spelling gain scores revealed a significant ($p < .08$) interaction effect resembling the effect on teacher ratings. Table 6 shows the mean change of spelling grades for the four groups.

Insert Table 6

The interaction effect for spelling was significant at the .08 level in analyses covarying age alone, and a combination of age and each of the six IQ and school achievement variables. The same pattern of means was found for reading and arithmetic, but none of the analyses reached statistical significance.

Discussion

The results leave no doubt that special class children's learning potential and their teachers' expectancies regarding such potential affected the teachers' perceptions of the children and their behavior, as well as the children's progress throughout the school year. Learning potential and teacher expectancies did not have a uniform, consistent effect on the different dependent variables, causing improvement on one set of variables, but

interacting to impede the progress of able children on another set of variables.

The findings clearly provide evidence for the validity of the learning potential measurement. This factor caused strong effects and contributed to consistent interaction effects. The learning potential measurement thus uncovered a significant psychological dimension, and the division of subjects into high and low learning potential groups resulted in meaningful distinctions among the special class students. Learning potential had the strongest impact on performance IQ (projected also in the multi-variate effect on all IQ variables and the uni-variate effect on total IQ). High learning potential subjects improved their performance from initial to final testing, while the low learning potential group showed a net decrease in score. This very effect provides further evidence to support the conceptualization of learning potential. "High Learning Potential" indicates that the child can learn from experience, compensate for deficiencies in his background, and improve his performance on reasoning tasks. The first TOGA testing served for these subjects the same functions as does the pre-test of the Learning Potential Test - acquainting them with the demands of the task, increasing their familiarity with the situation, and reducing their anxiety and expectations of failure. Their scores on the final TOGA (eight months later) do not therefore, necessarily reflect "higher intelligence," but rather, a better indication of their"true" intelligence. The effect of learning potential on performance IQ would probably have been even larger were any coaching

provided as well,and were the interval shorter than eight months. Subjects who did not gain from experience and coaching in the learning potential measurement showed a similar trend on the TOGA.

It is not surprising that learning potential affected performance IQ most strongly. Both tests consist of non-verbal reasoning problems which require the formation of appropriate strategies, and neither is directly school-related. Under these circumstances, the existence of an effect of teacher expectancies on performance IQ (even though it was rather weak) is somewhat puzzling. It is, however, far more puzzling that in interaction with teacher expectancies, learning potential impeded the progress and status of able children in school-related variables.

The speculative interpretation which follows looks at the entire situation from the teacher's point of view. Although speculative, it accounts for all the findings of this study. It suggests, in microcosm, how children are "taught" to be retarded, and how special classes can have a damaging effect on children who are misclassified as mentally retarded. It points out how mental retardation can become a self-fulfilling prophecy, and how "positive teacher expectancies" can threaten the teachers and boomerang on the more able children.

The teachers were told by their visitor ("Dr. X, the expert from Cambridge") that their students would be tested with a new test which uncovers potential ability to learn. Although they were told that this potential is latent, the initial teacher ratings on the "ability" dimension significantly distinguished between high

learning potential and low learning potential subjects (t = 1.687, df = 56, $p < .05$). At the same time, there were no significant differences between the learning potential groups on the three school achievement variables. Thus, the teachers had an implicit sense of potential ability, but this ability was not reflected in initial differences in school performance.

Following the testing, the investigator returned with feedback on the children's learning potential. Four groups were created - able children whose ability was now confirmed ("Hi LP - Hi EX"), able children whose ability was not confirmed and who may thus be somewhat less able ("Hi LP - Lo EX"), less able children whom the investigator claimed to be able but who performed poorly on the learning potential measure and who were seen as less potentially able by the teachers ("Lo LP - Hi EX"), and a final group of less able children whose lack of ability was confirmed by the learning potential measurement ("Lo LP - Lo EX").

Most crucial is the teachers's reaction to the "Hi LP - Hi EX" group. The potential ability of these children, which she implicitly recognized, was now confirmed by an expert. The investigator even mentioned that these children might not be retarded at all. However, their achievements in reading, spelling and arithmetic were not better than those of their special class peers. This situation might have become rather disturbing to the teachers, who felt the investigator blamed them for not "doing something" with the able children. The children's inferior school performance became <u>their fault</u>. A functional way of dealing with this indictment

and reducing the tension of the dissonance is to prove to themselves and the investigator that these children are actually less able, and could not achieve more than their peers. In other words, the threatened teachers may have had an interest in proving these children's lack of ability.

The /"Hi LP - Lo EX" and "Lo LP - Hi EX" groups were less threatening to the teacher, as she did not see the latter group as really able, while the former group was not declared able by the expert. In both cases, no blame or responsibility for their final attainments could be put on her. Both groups consisted of special class students who could probably improve somewhat, but of whom not much progress could be expected.

The investigator confirmed to the teachers that the "Lo LP - Lo EX" group was less able, and that these subjects were "bona fide retardates," of whom nothing much could be expected even in the individually structured environment of the special class.

An additional factor which may have contributed to the situation is the fact that able children often tend to be more curious, outgoing, and independent, and in this case that may have upset the babysitting nature of the special classes. (Mark that the only significant effect of learning potential on teacher ratings was found for the "personality" dimension). The teachers might not have liked this independence, reacting most severely against these children.

The pattern of change in teacher ratings corresponded to the pattern of children's gains in reading, spelling, and arithmetic (even though only the effect on spelling reached statistical significance). "Hi LP - Hi EX" children were penalized by the

teachers, subsequently improving less than"Hi LP - Lo EX" and "Lo LP - Hi EX" subjects.

The same pattern emerged in verbal IQ gain scores. Verbal IQ is a school-related variable which is influenced by school progress. The "Hi LP - Hi EX" group gained less than the "Lo LP - Hi EX" group (see Table 3). However, the negative change of the "Hi LP - Lo EX" group is rather odd, not in line with our interpretation. Close scrutiny of the data revealed that this decrease was caused by one subject, who dropped from initial to final testings by more than five grade equivalents in verbal IQ, pulling the mean of that group down and doubling its standard deviation. No other change approximating this magnitide was found for any subject on any variable. Concluding that this final score was influenced by random measurement factors, it was omitted, and the mean of the group re-calculated. The new mean of the "Hi LP - Lo EX" group was + 0.27, in line with our general interpretation.

Studying effects of counselors' expectancies and individual tutoring on institutionalized retardates, Anderson and Rosenthal (1968) discovered interaction effects somewhat similar to those found in this study. The individually tutored, high expectancy group showed an unexpected <u>decrease</u> in performance IQ, and all high expectancy subjects were observed to receive <u>less</u> counselor attention.

The two studies are dissimilar in almost every respect - setting, subjects, elicitation of expectancy, usage of Learning Potential, and type of schooling taking place - but the fact remains

that in both studies some of the results were opposed to what was initially expected, necessitating a closer look at underlying social mechanisms which affect the interactions of teachers and students.

Although rather speculative, the suggested interpretation accounts for all of the findings of this study. Most importantly, it resolves the paradox of how the able children could demonstrate their learning potential by gaining from experience and improving their performance IQ, while at the same time they fell back in performance on school-related variables and in the teachers' perceptions of them.

The findings of this study suggest how the label "mentally retarded" can result in a self-fulfilling prophecy, and how teachers may react to the "threat" of ability by penalizing their more able, disadvantaged special class students.

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Table 1

Analyses of Covariance of Gain on IQ Variables

Dependent Variable	Covariates	LP Effect	Expectancy Effect	Interaction Effect
Performance IQ	age	$p<.005$	$p<.06$	n.s.
	age, performance IQ (pre-test)	$p<.002$	n.s.	n.s.
	age, all IQ variables (pre-tests)	$p<.003$	n.s.	n.s.
	age, school achievement variables (pre-tests)	$p<.008$	$p<.055$	n.s.
	age, IQ variables, and achievement variables (pre-tests)	$p<.008$	n.s.	n.s.
Verbal IQ	age	n.s.	n.s.	n.s.
	age, verbal IQ (pre-test)	n.s.	n.s.	n.s.
	age, all IQ variables (pre-tests)	n.s.	n.s.	n.s.
	age, school achievement variables (pre-tests)	n.s.	$p<.11$	n.s.
Total IQ	age	$p<.06$	$p<.11$	n.s.
	age, total IQ (pre-test)	$p<.06$	n.s.	n.s.
	age, all IQ variables (pre-tests)	$p<.052$	n.s.	n.s.
	age, school achievement variables (pre-tests)	n.s.	$p<.062$	n.s.

Table 2

Mean Grade Equivalents Change in Performance IQ

for the Four Experimental Groups

		Learning Potential	
		low	high
Teacher Expectancy	high	0.00	0.82
	low	-0.58	0.08

Table 3

Mean Grade Equivalents Change in Verbal IQ

for the Four Experimental Groups

		Learning Potential: high	Learning Potential: low
Teacher Expectancy	high	0.67	0.34
	low	0.13	-0.27

Table 4

Analyses of Covariance of Change in Teacher Ratings

Dependent Variable	Covariates	LP Effect	Expectancy Effect	Interaction Effect
Academic Potential	none	n.s.	n.s.	$p<.02$
	all eight initial ratings	n.s.	n.s.	$p<.06$
Background	none	n.s.	n.s.	$p<.06$
	six initial ratings (but not background)	n.s.	n.s.	$p<.09$
Pleasant	none	n.s.	n.s.	n.s.
	all eight initial ratings	n.s.	n.s.	$p<.073$
Looks	none	n.s.	n.s.	$p<.10$
	initial ratings on "looks"	n.s.	n.s.	$p<.085$
Personality	none	n.s.	n.s.	$p<.09$
	four initial ratings	$p<.075$	n.s.	$p<.09$
Ability	none	n.s.	n.s.	n.s.
	initial ratings on "background"	n.s.	n.s.	$p<.08$
Cooperative	none	n.s.	n.s.	n.s.
	any covariates	n.s.	n.s.	n.s.
Polite	none	n.s.	n.s.	n.s.
	any covariates	n.s.	n.s.	n.s.

Table 5

Mean Change in Teacher Rating of Academic Potential for the Four Experimental Groups

		Learning Potential	
		low	high
Teacher Expectancy	high	0.36	-0.73
	low	-0.47	0.20

Table 6

Mean Change in Spelling Grade Equivalents
on the WRAT for the Four Experimental Groups

		Learning Potential	
		low	high
Teacher Expectancy	high	0.58	0.39
	low	0.33	0.62